WHAT IS CLAIMED IS:

1.   Automatic test equipment for testing non-deterministic packet data from a device-under-test, the automatic test equipment including:

a memory for storing expected packet data;

a receiver for receiving the packet data from the device-under-test; and

a data validation circuit coupled to the receiver for validating the non-deterministic packet data based on the expected packet data from the memory.

2.   Automatic test equipment according to claim 1 wherein the non-deterministic packet data validation circuit includes:

a first-in-first-out circuit having an input coupled to the receiver and an output; and

a comparator having a first input coupled to the first-in-first-out circuit and a second input coupled to the memory, the comparator operative to compare the first-in-first-out output to the expected packet data from the memory.

3.   Automatic test equipment according to claim 2 and further including:

a filter having an input coupled to the memory and an output coupled to the comparator second input, the filter configured to mask idle packet data.

4.   Automatic test equipment according to claim 1 wherein the memory expected packet data includes predetermined signatures representing valid packet data combinations from the device-under-test, the non-deterministic packet data validation circuit including:

a signature generator for creating actual signatures based upon actual data combinations received from the receiver; and

a comparator for comparing the actual signatures to the predetermined signatures to identify valid packet data.

5.   Automatic test equipment according to claim 4 and further including:

a capture memory coupled to the receiver for storing the packet data received by the receiver.

6.   Automatic test equipment according to claim 4 wherein the signature generator comprises a CRC arithmetic register.

7.   Automatic test equipment according to claim 6 wherein the CRC arithmetic register comprises a linear feedback shift register.

8.   Automatic test equipment for testing non-deterministic packet data from a device-under-test, the automatic test equipment including:
        means for storing expected packet data;
        means for receiving non-deterministic packet data from the device-

5   under-test; and
        means for validating non-deterministic packet data based on the expected packet data from the vector memory.

9.   Automatic test equipment according to claim 8 wherein the means for validating includes:
        a first-in-first-out circuit having an input coupled to the receiver and an output; and

5   a comparator having a first input coupled to the first-in-first-out circuit and a second input coupled to the means for storing expected packet data, the comparator operative to compare the first-in-first-out output to the expected packet data from the means for storing expected packet data.

10.   Automatic test equipment according to claim 8 wherein the means for storing expected packet data includes means for storing predetermined signatures representing valid packet data combinations from the device-under-test, the means for

5   validating including:
        means for generating a signature based upon actual data combinations received from the receiver; and
        means for comparing the actual signatures to the predetermined signatures to identify valid packet data.

10
11.   Automatic test equipment according to claim 8 and further including:
        means for capturing the actual data from the receiver.

12.   Automatic test equipment according to claim 10 wherein the means for generating a signature includes:

a CRC arithmetic register.

13.   Automatic test equipment according to claim 12 wherein the CRC arithmetic register comprises:

a linear feedback shift register.

14.   A method for testing non-deterministic packet data using automatic test equipment having a memory for storing expected packet data, the method including the steps:

receiving actual non-deterministic packet data from a device-under-

5   test; and

validating the non-deterministic packet data based on the expected packet data from the memory.

15.   A method according to claim 14 wherein the validating step includes:

pipelining the received data such that the first packet received is the first packet validated;

comparing, in the order received, each actual packet to the stored

5   expected paket data in the memory; and

validating the non-deterministic packet data based on the comparing step.

16.   A method according to claim 15 wherein the expected data includes idle data, the method further includes the step:

filtering the idle data to generate filtered expected data, and wherein the comparing step includes comparing, in the order received, each actual packet to

5   the filtered expected data.

17.   A method according to claim 11 wherein the memory stores predetermined valid signatures representing valid packet data combinations from the device-under-test, and wherein the validating step includes:

generating an actual signature for each received data packet;

comparing the generated actual signature to the predetermined valid signatures; and

determining whether the received data packet passed or failed based on the comparison of the signatures.

18.   A method according to claim 17 wherein the step of generating an actual signature includes:

calculating a checksum from the received packet data.

19.   A method for validating non-deterministic packet data from a device-under-test using automatic test equipment, the automatic test equipment having a memory, the method including the steps:

establishing a library of known passing/failing signatures in the

5   memory;

testing the device-under-test;

generating a signature of actual data captured during the testing step;

comparing the generated signature from the captured data to the library of known passing/failing signatures;

10   determining a pass/fail result for the device test if the compared signature matches a signature in the library;

evaluating the captured data to determine whether the device passed/failed if the compared signature does not match the library;

generating a new signature for the evaluated captured data; and

15   adding the new signature to the library of known passing/failing signatures.